The following is a corrected complete list of the claims pursuant to 37CFR 1.121.

Claims:

1. [Canceled] An illuminating device providing controlled illumination comprising: a) a plurality of independent light sources, each said independent light source emanates light having a spatial light intensity distribution characteristic and each said independent light source emanates light having spectral wavelength characteristics, b) a structure having predetermined form and orientation where said orientation is correlated to the environment to be illuminated and, c) said independent light sources attached to said structure such that said spatial light intensity distribution has a directionality respective to said orientation and, d) said directionality effects the mixing, adding and distribution of emanating light such that said controlled illumination is a product of said independent light sources, whereby a new, more useful illuminating characteristic differing in its intensity, intensity spatial distribution and spectral composition has been created.

2. [Canceled] The illuminating device of claim 1 is an application oriented luminaire designed according to correct lighting practice, providing said controlled illumination in the correct light intensity, spectrum, and spatial distribution of intensity and spectrum, suited to the specific lighting application, comprising a plurality of individual light sources capable, in combination, of providing the correct intensity, spectrum, and spatial distribution of intensity and spectrum.

3. [Canceled] The illuminating device of claim 1 wherein the correct light intensity, spectrum, and spatial distribution of intensity and spectrum is adjusted for changes in the lighting application environment comprising a means for changing the light emanating characteristics of individual light sources capable, in combination, of providing the correct intensity, spectrum, and spatial distribution of intensity and spectrum as a function of time.

4. [Canceled] The illuminating device of claim 1, wherein the illuminating device is a luminaire providing controlled illumination comprising: a) plurality of independent light sources, each said independent light source having said characteristics, b) a structure having predetermined form and preferred orientation where said preferred orientation is correlated to the environment to be illuminated and c) said independent light sources attached to said structure such that the spatial light intensity distribution of said independent light sources is having a directionality to said structure and position on said geometric support structure of said light sources having known light intensity and spectral characteristics, and d) where said spatial light intensity distribution characteristic, spectral wavelength characteristic, position and directionality is individually determined by using equations to calculate the required light source properties according to one or more of the lighting application requirements, including illuminance, color temperature and color rendering over the area and one or more of the luminaire design criterion where the criterion include luminous intensity, spectral wavelength distribution, the requirement of maintaining an acceptable continuum of spatial illumination and color effects and the

requirement of maintaining an acceptable glare rating for the luminaire and e) where the support structure has a considered geometry determined by the requirement of supporting the said independent light sources at the proper aimings and positions on the surface and f) where size, shape and coloring of the geometric support structure is also function of one or more considerations including containing the light sources, the ancillary equipment and aesthetic considerations.

5. [Canceled] The illuminating device of claim 1, further comprising elements selected from the group consisting of: a) a power supply element providing current at a voltage to the light sources and other ancillary equipment; and, b) a differentiated power supply element capable of varying power to said independent light sources having means to effect the sending or not sending an independent electric power signal differentiated in voltage, current or frequency to each light source or group of light sources; and, c) a controller for adjusting the power to the light sources to such that a particular amount of power supplied to the light source generates a corresponding intensity and provide the correct intensity, spectrum, and spatial distribution of intensity and spectrum for the application; and, d) a storage media device capable of storing and recalling stored data relating to performance, algorithms, lighting parameters and, e) a controller capable of receiving inputs and by means of recalling stored parameters, processing algorithms, and calculating results, generates output control signals to adjust the illumination according to correct lighting practice; and, f) a photosensor for providing light spectrum and intensity information to the controller, said information for use in said adjusting; and, g) a motion detector for providing occupant sensing information to the controller, said information for use in said adjusting; and, h) a communications element coupled to the controller comprised of a receiver for receiving a data signal from an external device, and,i) a communications element coupled to the controller comprised of a transmitter for transmitting a data signal to an external device, and, j) a remote control man-machine interface input device capable of communicating data with the communications element; and, k) a machine vision system comprised of an imaging device, object recognition and, l) optical elements situated proximate to each individual light source, groupings of light source or all the light sources to control the direction of the emanating light, where the term optical refers methodologies used for redirecting light rays through any of the known phenomenon including: reflection, refraction and diffraction, m) a mechanical assembly for the support of light sources, power supplies, controllers, sensors and other ancillary equipment and, o) a satellite reflector receiving light from the luminaire and redirecting said light to illuminate a distant area.

6. [Canceled] The illuminating device of claim 1, wherein said controller is selected from the list consisting of, a) an open-loop controller, factory programmed, for use in general lighting according to correct lighting practice: and, b) an open-loop controller, user-programmed, by use of a programming method taking into account the lighting requirements of the environment in which the luminaire is to be used: and; c) a closed loop controller, user-programmed, by use of a programming method taking into account the lighting requirements of the environment in which the luminaire is to be used; and, d) a closed loop controller user-programmed, by use of a programming method taking into account the lighting requirements of the environment and self-adjusting in response to the

changing lighting requirements of the environment in which the luminaire is located: and, e)a closed loop controller, self-adjusting in response to the lighting requirements of the environment in which the luminaire is located, without pre-programming.

7. [Canceled] A luminaire comprising: a) light sources potentially having intensity and spectrum characteristic change over life of said light sources; and, b) self-calibration correcting for said aging of said light sources.

8. [Canceled] The luminaire of claim 7, wherein said self-calibration comprises: a) a photodetector for measuring light output of light sources; and, b) reference light sources not having said aging, for providing reference light output to the photodetectors, for use in said self-calibration; and, c) a reference reflective surface of having known reflectance properties for use in said self-calibration.

9. [Canceled] The luminaire of claim 8, wherein said reference light sources are selected from the list consisting of: a) reference light sources similar to the light sources used for illumination, the reference light sources not used for illumination, hence not having aging; and, b) reference light sources not similar to the light sources used for illumination, said not similar light sources selected from the list consisting of 1) daylight; and, 2) white LEDs.

10. [Canceled] The luminaire of claim 6, wherein said self-adjusting is performed in a short time interval, such that the self-adjusting is not noticeable to an observer; and, such that adjacent luminaires do not interact, due to low probability of two luminaires self-adjusting simultaneously; and, extremely low probability of two adjacent luminaires self-adjusting repeatedly simultaneously; due to random timing variations of the timing circuitry which initiates the self-adjusting interval in each luminaire.

11. [Canceled] A method for designing an application oriented luminaire comprising the steps of: a) determining the application and illuminance requirements b) determining the illumination area or field of view to be covered c) determining the light source aimings which meet the said illuminance requirements.

12. [Canceled] The method for designing an application oriented luminaire of claim 11, designed according to correct lighting practice, providing the correct light intensity, spectrum, and spatial distribution of intensity and spectrum, suited to the specific lighting application, comprising the steps of: a) determining the lighting application, and the recommended lighting practices for the application b) determining the luminaire mounting height, illumination area covered and surrounding conditions typical of the application c) determining light power required to effect the required illumination over the area d)selecting SLS types capable of producing required intensities and spectrum at highest conversion efficiencies at lowest economic cost e)determining SLS beam spreads f)determining SLS aimings for the required distribution pattern g)determining electronics to control and power SLS h)determining lighting fixture surface geometry and size i)testing whether the glare rating for the viewing angle is acceptable j)if the glare rating is not acceptable, then changing SLS beam spread, fixture geometries, or size, resulting in

an acceptable glare rating; and, h)when the glare rating is acceptable, then designing the luminaire aesthetics for the application.

13. [Canceled] The method of selling an application oriented luminaire comprising: a) Having the customer know information about the illumination area to be covered and application of illumination to be provided, b) providing luminaire information in terms of illiminace vales specifying and selling the luminaire by area covered by the illumination provided, hence by the "coverage area", concept, not by the prior art light bulb, watts and lumens concept.

14. [Canceled] The illuminating device of claim 1, further comprising: a) light sources mounted on a substrate, b) conductors are disposed on said substrate and c) a plurality light source elements are attached to said substrate and connected to said conductors to receive power signals and d) where said light emitting elements being formed of non-packaged semiconductor junctions and , e) said light emitting elements are mounted on a support structure having a geometry and, f) where said support structure has means for transferring heat and g) where the said light emitting elements are of directional orientation mounting providing the proper ratios of spectral wavelengths and illumination.

15. [Canceled] The illuminating device of claim 2 wherein the lighting application is a street light having differentiated spectral wavelength output over the spatial distribution.

16. [Canceled] The illuminating device of claim 15 wherein the lighting application is a street light having differentiated spectral wavelength output over the spatial distribution and varying intensity over time in relation to changing environmental conditions including traffic conditions.

17. [Canceled] The illumination device of claim 2, wherein the lighting application is a automotive headlamp having differentiated intensity spectral wavelength output over the spatial distribution which is varies acoording to the environmental conditions including one or more factors such as speed, oncoming traffic and dynamic road requirements.

18. [Canceled] The illumination device of claim 17 wherein the control system to dynamically vary the illumination receives inputs from a machine vision system with means for imaging and object recognition.

19. [Canceled] The illumination device of claim 2 wherein the luminaire has means of providing both "background" room lighting, and "task" lighting, and said spatial distribution of spectrum and intensity, further including positional dependence of spectrum vs. intensity and a specified design range of spectrum vs. intensity.

20. [Canceled] An illuminating device providing controlled illumination in an environment to be illuminated comprising:

a) a plurality of independent light sources, each said independent light source emanates light having an intensity, spatial light-intensity-distribution characteristic and each said independent light source emanates light having spectral wavelength characteristics,

b) a structure having predetermined form and orientation where said orientation is capable of being correlated to said environment to be illuminated and,

c) said independent light sources attached to said structure such that said spatial light intensity distribution has a directionality respective to said orientation and,

d) said directionality effects the mixing, adding and distribution of emanating light such that said controlled illumination in said environment to be illuminated is a product of said plurality of independent light sources,

whereby a new, more useful illuminating characteristic differing in intensity, intensity spatial distribution and spectral composition has been created in the environment to be illuminated.

21. [Canceled] The illuminating device of claim 20 is a lighting application oriented luminaire designed according to principles of lighting practice, providing said controlled illumination intensity, spectrum, and spatial distribution of intensity and spectrum, suited to the specific lighting application, comprising a plurality of individual light sources capable, when operating in combination, of providing the correct intensity, spectrum, and spatial distribution of intensity and spectrum for the environment to be illuminated.

22. [Canceled] The illuminating device of claim 21 wherein the intensity, spectrum, and spatial distribution of intensity and spectrum is adjusted for changes in the environment to be illuminated in accordance with the lighting application comprising: a) a means for sensing the changed and b) a means for changing the light emanating characteristics of the individual light sources, thereby providing the correct intensity, spectrum, and spatial distribution of intensity and spectrum as a function of time.

23. [Canceled] The illuminating device of claim 20, wherein the illuminating device has structure and is a luminaire providing controlled illumination comprising:

a) light sources having light intensity, spatial light intensity distribution and spectral characteristics, and

b) where said light sources are attached to the structure such that the spatial light intensity distribution of said independent light sources is having a directionality to said structure and position on said geometric support structure, and

c) where said spatial light intensity distribution characteristic, spectral wavelength characteristic, position and directionality is individually determined by using lighting equations to calculate the required light source properties according to one or more of the lighting application requirements, and

d) where said requirements include any items from the list comprised of: illuminance, color temperature and color rendering over the environment to be illuminated and

e) where the luminaire design criterion include any items from the list comprised of: luminous intensity, spectral wavelength distribution, the requirement of maintaining an acceptable continuum of spatial illumination and the requirement of maintaining an acceptable continuum of spatial color effects and the requirement of maintaining an acceptable glare rating for the luminaire, and

f) where the support structure has a considered geometry determined by the requirement of supporting the said independent light sources at the proper aimings and positions on the surface, and

g) where size, shape and coloring of the geometric support structure is also function of one or more considerations including containing the light sources, the ancillary equipment and aesthetic considerations.

24. [Canceled] The illuminating device of claim 21, further comprising elements selected from the group consisting of:

a) a power supply element providing current at a voltage to the light sources and other ancillary equipment; and,

b) a differentiated power supply element capable of varying power to said independent light sources having means to effect the sending or not sending an independent electric power signal differentiated in voltage, current or frequency to each light source or group of light sources; and,

c) a controller for adjusting the power to the light sources to such that a particular amount of power supplied to the light source generates a corresponding intensity and provides the correct intensity, spectrum, and spatial distribution of intensity and spectrum for the application; and,

d) a storage media device capable of storing and recalling stored data relating to performanoe, algorithms, lighting parameters and,

e) a controller capable of receiving inputs and by means of recalling stored parameters, processing algorithms, and calculating results, generates output control signals to adjust the illumination according to correct lighting practice; and,

f) a photosensor for providing light spectrum and intensity information to the controller, said information for use in said adjusting; and,

g) a motion detector for providing occupant sensing information to the controller, said information for use in said adjusting; and,

h) a communications element coupled to the controller comprised of a receiver for receiving a data signal from an external device, and,

i) a communications element coupled to the controller comprised of a transmitter for transmitting a data signal to an external device, and,
j) a remote control man-machine interface input device capable of communicating data with the communications element; and,
k) a machine vision system comprised of an imaging device, object recognition and,
l) optical elements situated proximate to each individual light source, groupings of light source or all the light sources to control the direction of the emanating light, where the term optical refers methodologies used for redirecting light rays through any of the known phenomenon including: reflection, refraction and diffraction,
m) a mechanical assembly for the support of light sources, power supplies, controllers, sensors and other ancillary equipment and,
n) a satellite reflector receiving light from the luminaire and redirecting said light to illuminate a distant area.

25. [Canceled] The illuminating device of claim 24, wherein said controller is selected from the list consisting of,
a) an open-loop controller, factory programmed, for use in general lighting according to correct lighting practice: and,
b) an open-loop controller, user-programmed, by use of a programming method taking into account the lighting requirements of the environment in which the luminaire is to be used: and;
c) a closed loop controller, user-programmed, by use of a programming method taking into account the lighting requirements of the environment in which the luminaire is to be used; and,
d) a closed loop controller user-programmed, by use of a programming method taking into account the lighting requirements of the environment and self-adjusting in response to the changing lighting requirements of the environment in which the luminaire is located: and,

e) a closed loop controller, self-adjusting in response to the lighting requirements of the environment in which the luminaire is located, without pre-programming.

26. [Canceled] A method for designing an application oriented luminaire comprising the steps of :

a) determining the application and illuminance requirements

b) determining the illumination area or field of view to be covered

c) determining the light source aimings which meet the said illuminance requirements.

27. [Canceled] The method for designing a lighting application oriented luminaire of claim 26, designed according to lighting practice, providing light intensity, spectrum, and spatial distribution of intensity and spectrum, suited to the environment to be illuminated further comprising steps selected from the group consisting of:

a. determining the lighting application, and the recommended lighting practices for the application, and
b. determining the luminaire mounting height, illumination area covered and surrounding conditions typical of the application, and
c. determining light power required to effect the required illumination over the area, and
d. selecting light source types capable of producing required intensities and spectrum at highest conversion efficiencies at lowest economic cost, and
e. determining light source beam spreads, and
f. determining light source aimings for the required distribution pattern, and
g. determining electronics to control and power light source, and
h. determining lighting fixture surface geometry and size, and
i. testing whether the glare rating for the viewing angle is acceptable and
j. if the glare rating is not acceptable, then changing light source beam spread, and fixture geometries, or size, resulting in an acceptable glare rating; and,

k. when the glare rating is acceptable, then designing the luminaire aesthetics for the application .

28. [Canceled] An illuminating device providing controlled illumination in an environment to be illuminated comprising:

a) a plurality of light sources emanating light, said light sources having a respective spatial light intensity distribution of substantial directionality and said light sources having a respective spectral wavelength characteristic;

b) a structure having a geometry where said structure has apparatus for correlating said geometry to said environment to be illuminated;

c) a first light source mounted to said structure such that said spatial light intensity distribution has a directionality respective to said geometry;

d) one or more additional light sources mounted to said structure such that said light source's spatial light intensity distribution has a directionality respective to said geometry differing from the directionality of the first; and

e) where said directionality which effects the mixing, adding and distribution of emanating light is determined according to the environment to be illuminated

so as to produce a new, more useful and precise illuminating characteristic such as providing a uniform illumination at points non-equidistant from the illuminating device.

29. [Canceled] The illuminating device of claim 28 is a lighting application oriented luminaire designed according to principles of lighting practice, providing said controlled illumination intensity, spectrum, and spatial distribution of intensity and spectrum, suited to the specific lighting application, comprising a plurality of light sources capable, when operating in combination, of providing the correct intensity, spectrum, and spatial distribution of intensity and spectrum for the environment to be illuminated.

30. [Canceled] The illuminating device of claim 29 wherein the intensity, spectrum, and spatial distribution of intensity and spectrum is adjusted for changes in the environment to be illuminated in accordance with the lighting application comprising: a) a means for sensing the changes and b) a means for changing the light emanating characteristics of the light sources, thereby providing the correct intensity, spectrum, and spatial distribution of intensity and spectrum as a function of time.

31. [Canceled] The illuminating device of claim 28, wherein the illuminating device has structure and is a luminaire having functional, accepted comfort and aesthetic characteristics providing controlled illumination comprising:

h) a plurality of light sources having light intensity, spatial light intensity distribution and spectral characteristics, and

i) where said light sources are attached to the structure such that the spatial light intensity distribution of said independent light sources is having a directionality to said structure and position on said geometric support structure, and

j) where said spatial light intensity distribution characteristic, spectral wavelength characteristic, position and directionality of a light source is determined by using lighting equations to calculate the required light source properties according to one or more of the lighting application requirements, and

k) where said requirements include calculatable items from the list comprised of: illuminance, color temperature and color rendering over the environment to be illuminated and

l) where the luminaire design criterion include any items from the list comprised of: luminous intensity, spectral wavelength distribution, the requirement of maintaining an acceptable continuum of spatial illumination and the requirement of maintaining an acceptable continuum of spatial color effects and the requirement of maintaining an acceptable glare rating for the luminaire, and

m) where the support structure has a considered geometry determined by the requirement of supporting the said independent light sources at the proper aimings and positions on the surface, and

n) where size, shape and coloring of the geometric support structure is also function of one or more considerations including containing the light sources, the functional ancillary equipment and aesthetic considerations.

32. [Canceled] The illuminating device of claim 29, further comprising elements selected from the group consisting of:

a) a power supply element providing current at a voltage to the light sources and other ancillary equipment; and,

b) a differentiated power supply element capable of varying power to said independent light sources having means to effect the sending or not sending an independent electric power signal differentiated in voltage, current or frequency to each light source or group of light sources; and,

c) a controller for adjusting the power to the light sources to such that a particular amount of power supplied to the light source generates a corresponding intensity and provides the correct intensity, spectrum, and spatial distribution of intensity and spectrum for the application; and,

d) a storage media device capable of storing and recalling stored data relating to performance, algorithms, lighting parameters and,

e) a controller capable of receiving inputs and by means of recalling stored parameters, processing algorithms, and calculating results, generates output control signals to adjust the illumination according to correct lighting practice; and,

f) a photosensor for providing light spectrum and intensity information to the controller, said information for use in said adjusting; and,

g) a motion detector for providing occupant sensing information to the controller, said information for use in said adjusting; and,

h) a communications element coupled to the controller comprised of a receiver for receiving a data signal from an external device, and,

i) a communications element coupled to the controller comprised of a transmitter for transmitting a data signal to an external device, and,

j) a remote control man-machine interface input device capable of communicating data with the communications element; and,

k) a machine vision system comprised of an imaging device, object recognition and,

l) optical elements situated proximate to each individual light source, groupings of light source or all the light sources to control the direction of the emanating light, where the term optical refers methodologies used for redirecting light rays through any of the known phenomenon including: reflection, refraction and diffraction,

m) a mechanical assembly for the support of light sources, power supplies, controllers, sensors and other ancillary equipment and,

n) a satellite reflector receiving light from the luminaire and redirecting said light to illuminate a distant area.

33. [Canceled] The illuminating device of claim 32, wherein said controller is selected from the list consisting of,

a) an open-loop controller, factory programmed, for use in general lighting according to correct lighting practice: and,

b) an open-loop controller, user-programmed, by use of a programming method taking into account the lighting requirements of the environment in which the luminaire is to be used: and;

c) a closed loop controller, user-programmed, by use of a programming method taking into account the lighting requirements of the environment in which the luminaire is to be used; and,

d) a closed loop controller user-programmed, by use of a programming method taking into account the lighting requirements of the environment and self-adjusting in response to the changing lighting requirements of the environment in which the luminaire is located: and,

e) a closed loop controller, self-adjusting in response to the lighting requirements of the environment in which the luminaire is located, without pre-programming.

34. [Canceled] A method for designing an lighting application oriented luminaire comprised of a plurality of light sources having light intensity, spatial light intensity distribution and spectral characteristics, providing controlled illumination in an environment to be illuminated comprising the steps of :

a) determining the application and illuminance requirements of said environment to be illuminated

b) determining the illumination area of said environment or field of view to be covered

c) determining the light source intensity, spatial intensity distribution, spectral wavelength charactreristic and directionality aimings which meet the said illuminance requirements.

35. [Canceled] The method for designing a lighting application oriented luminaire of claim 34, designed according to lighting practice, providing light intensity, spectrum, and spatial distribution of intensity and spectrum, suited to the environment to be illuminated further comprising steps selected from the group consisting of:

l. determining the lighting application, and the recommended lighting practices, illumination and glare ratings required for the application, and

m. determining the luminaire mounting height, illumination area covered and surrounding conditions of the application, and

n. determining light power required to effect the required illumination over the area, and

o. selecting light sources capable of producing required intensities and spectrum at highest conversion efficiencies at lowest economic cost, and

p. determining light source beam spreads, and

q. determining light source aimings for the required distribution pattern, and

r. determining electronics to control and power light source, and

s. determining lighting fixture surface geometry size andglare rating, and

t. testing whether the glare rating for the viewing angle is acceptable and

u. if the glare rating is not acceptable, then changing light source beam spread, and fixture geometries, or size, resulting in an acceptable glare rating; and,

v. when the glare rating is acceptable, then designing the luminaire aesthetics for the application

36. [Canceled] A multiple light source illuminating device capable of providing light at optimal levels of illuminance and color spectrum to predetermined surfaces within a geometric living space comprising:

(a) a first light source having a spectral color distribution and having a substantial directionality of spatial light intensity distribution that is capable of being aimed at a specific surface in the living space; and

(b) an illuminating device structure, said structure having means of being oriented relative to the geometry living space; and said structure having surfaces and apparatus for the mounting of a plurality of light sources thereon; and

(c) said first light source mounted on the structure wherein the spatial light distribution of said first light source is aimed at a first surface in the living space; and

(d) one or more additional light sources having a spatial light intensity distribution and spectral color distribution mounted to said structure where the spatial light intensity distribution of the additional light source is aimed at additional surfaces in the living space,

whereby the greater and lesser concentration of the light sources at particular orientations and aimings on the surface of the illuminating device structure controls the illuminance and color spectrum provided to the predetermined surface areas within the living space allowing for their optimization.

37. [Canceled] The multiple light source illuminating device of claim 36 capable of providing light at optimal levels of illuminance and color spectrum to predetermined surfaces within a geometric living space further comprising:

(a) a first light source having a spectral color distribution and having a substantial directionality of spatial light intensity distribution that is capable of being aimed at a specific surface in the living space; and

(b) an illuminating device structure, said structure having means of being oriented relative to the geometry living space; and said structure having surfaces and apparatus for the mounting of a plurality of light sources thereon; and

(c) said first light source mounted on the structure wherein the spatial light distribution of said first light source is aimed at a first surface in the living space; and

(d) one or more additional light sources having a spatial light intensity distribution and spectral color distribution mounted to said structure where the spatial light intensity distribution of the additional light source is aimed substantially towards said first surface so that the illuminance and color spectrum on the surface is provided at the optimal level; and

(e) further additional light sources having a spatial light intensity distribution and spectral color distribution mounted to the said structure and aimed at additional surfaces in the living space to the extent wherein the optimal levels of illuminance and color spectrum to each of the additional surfaces is provided,

whereby the greater and lesser concentration of the light sources at particular orientations and aimings on the surface of the illuminating device structure controls the illuminance and color spectrum provided to the predetermined surface areas within the living space allowing for their optimization.

38. [Canceled] The illuminating device of claim 37 wherein the optimal illuminance level is uniform illumination over the surfaces at a certain height within the living space whether said surface is directly below the illuminating device or off in a distant corner.

39. [Canceled] The illuminating device of claim 37 wherein the optimal illuminance is increased task lighting illuminance in a certain area of the living space and general lighting illuminance level over the rest of the area.

40. [Canceled] The illuminating device of claim 37 wherein said structure is specifically oriented relative to the geometry living space by being affixed to a surface therein.

41. [Canceled] The illuminating device of claim 37 wherein the light sources are groupings of more than one light source mounted to said structure and where the spatial light distribution aimings of the group light sources are substantially similar.

42. [Canceled] The illuminating device of claim 37 is a lighting application oriented luminaire based on the visual tasks to be carried out within the living space designed according to principles of lighting practice, providing controlled illumination intensity, spectrum, luminous exitance and spatial distribution of intensity and spectrum, suited to the specific lighting application, comprising multiple light sources mounted on said structure, capable when operating in combination, of providing the correct intensity, spectrum, and spatial distribution of intensity, luminous exitance and spectrum for the living space to be illuminated.

43. [Canceled] The illuminating device of claim 41 wherein the intensity, spectrum, and spatial distribution of intensity and spectrum is adjusted for changes in the living space to be illuminated in accordance with the lighting application comprising:
   (a) a means for sensing the changes; and
   (b) a means for changing the light emanating characteristics of the light sources, thereby providing the correct intensity, spectrum, and spatial distribution of intensity and spectrum as a function of time.

44. [Canceled] The illuminating device of claim 36, wherein the illuminating device has structure and is a luminaire having functional, accepted comfort and aesthetic characteristics providing controlled illumination comprising:

(a) a plurality of light sources having light intensity, spatial light intensity distribution and spectral characteristics, and

(b) where said light sources are in mechanical and electrical communication to the structure such that the spatial light intensity distribution of said independent light sources is having a directionality to said structure and position on said geometric support structure, and

(c) wherein the mounting to provide spatial light intensity distribution characteristic, spectral wavelength characteristic, position and directionality of a light source is determined by using lighting equations to calculate the required light source properties according to one or more of the lighting application requirements, and

(d) where said lighting requirements include calculatable items from the list comprised of: illuminance, color temperature and color rendering over the living space to be illuminated, and

(e) where the luminaire design criterion include any items from the list comprised of: luminous intensity, spectral wavelength distribution, the requirement of maintaining an acceptable continuum of spatial illumination and the requirement of maintaining an acceptable continuum of spatial color effects and the requirement of maintaining an acceptable glare rating for the luminaire, and

(f) where the said structure has a considered geometry determined by the requirement of supporting the said independent light sources at the proper aimings and positions on the surface, and

(g) where size, shape and coloring of the said support structure is also function of one or more considerations including containing the light sources, the functional ancillary equipment and aesthetic considerations.

45. [Canceled] The illuminating device of claim 42, further comprising elements selected from the group consisting of:

(a) a power supply element providing current at a voltage to the light sources and other ancillary equipment;

(b) a differentiated power supply element capable of varying power to said independent light sources having means to effect the sending or not sending an

independent electric power signal differentiated in voltage, current or frequency to each light source or group of light sources;

(c) a controller for adjusting the power to the light sources to such that a particular amount of power supplied to the light source generates a corresponding intensity and provides the correct intensity, spectrum, and spatial distribution of intensity and spectrum for the application;

(d) a storage media device capable of storing and recalling stored data relating to performance, algorithms, lighting parameters;

(e) a controller capable of receiving inputs and by means of recalling stored parameters, processing algorithms, and calculating results, generates output control signals to adjust the illumination according to correct lighting practice;

(f) a photosensor for providing light spectrum and intensity information to the controller, said information for use in said adjusting;

(g) a motion detector for providing occupant sensing information to the controller, said information for use in said adjusting;

(h) a communications element coupled to the controller comprised of a receiver for receiving a data signal from an external device;

(i) a communications element coupled to the controller comprised of a transmitter for transmitting a data signal to an external device;

(j) a remote control man-machine interface input device capable of communicating data with the communications element;

(k) a machine vision system comprised of an imaging device, object recognition and optical elements situated proximate to each individual light source, groupings of light source or all the light sources to control the direction of the emanating light, where the term optical refers methodologies used for redirecting light rays through any of the known phenomenon including: reflection, refraction and diffraction;

(l) a mechanical assembly for the support of light sources, power supplies, controllers, sensors and other ancillary equipment;

(m) a satellite reflector receiving light from the luminaire and redirecting said light to illuminate a distant area.

46. [Canceled] The illuminating device of claim 45, wherein said controller is selected from the list consisting of:

(a) an open-loop controller, factory programmed, for use in general lighting according to correct lighting practice;

(b) an open-loop controller, user-programmed, by use of a programming method taking into account the lighting requirements of the environment in which the luminaire is to be used;

(c) a closed loop controller, user-programmed, by use of a programming method taking into account the lighting requirements of the environment in which the luminaire is to be used;

(d) a closed loop controller user-programmed, by use of a programming method taking into account the lighting requirements of the environment and self-adjusting in response to the changing lighting requirements of the environment in which the luminaire is located;

(e) a closed loop controller, self-adjusting in response to the lighting requirements of the environment in which the luminaire is located, without pre-programming.

47. [Canceled] A method for constructing a multiple light source illuminating device capable of providing light at optimal levels of illuminance and color spectrum to predetermined surfaces within a geometric living space comprising the steps of:

(a) providing the illuminating device with a structure which is capable of being oriented to the geometry of the living space, and

(b) providing said structure elements for mechanically and electrically joining the light sources to the structure, and

(c) positioning light sources in greater and lesser concentration at particular orientations and aimings on the surface of the illuminating device structure to provide meted illuminance and color spectrum to differently positioned and distanced surface areas within the living space whereby the illuminance and spectrum is at optimal levels.

48. [Canceled] The method of claim 47 further comprising the steps of:
(a) determining the illuminance and spectrum requirements of the lighting application and visual tasks to be carried out within the living space, and
(b) determining the illumination area, distances of from the illuminating device of the surfaces within the living space to be covered, and
(c) determining the light source intensity, spatial intensity distribution, spectral wavelength characteristic and directionality aimings of the multiple light sources mounted on said structure which meet the said illuminance requirements.

49. [Canceled] The method for designing the illuminating device of claim 47, designed according to lighting practice, providing light intensity, spectrum, flare related luminous exitance and spatial distribution of intensity and spectrum, suited to the living space to be illuminated further comprising steps selected from the group consisting of:
(a) determining the lighting application, and the recommended lighting practices, illumination and glare ratings required for the application;
(b) determining the luminaire mounting height, illumination area covered and surrounding conditions of the application;
(c) determining light power required to effect the required illumination over the area;
(d) selecting light sources capable of producing required intensities and spectrum at highest conversion efficiencies at lowest economic cost;
(e) determining light source beam spreads;
(f) determining light source aimings for the required distribution pattern;
(g) determining electronics to control and power light source;
(h) determining lighting fixture surface geometry size and glare rating;
(i) testing whether the glare rating for the viewing angle is acceptable;
(j) if the glare rating is not acceptable, changing light source beam spread and fixture geometries, or size, resulting in an acceptable glare rating;
(k) when the glare rating is acceptable, then designing the luminaire aesthetics for the application.

50 [New] An illuminating device having an overall light distribution pattern calculated to efficiently provide predetermined surface areas with a design illuminance and color, comprising:

a) a multiplicity of light sources having respective spectral distributions and respective light distribution patterns which are directional and subtend lesser angles than those of the overall light distribution pattern, and

b) a light source mounting structure configured to mount the light sources which are arranged on the structure such that the respective directional light distribution patterns and the respective spectral distributions combine to form the overall light distribution pattern calculated to efficiently provide the predetermined surface areas with the design illuminance,

whereby the overall light distribution pattern, subtending greater angles than that of the respective light distribution patterns is produced directly by the multiplicity of light sources without recourse to at least one of non-integral reflectors and refractors.

51 [New] The illuminating device of claim 50 intended for positioning relative to the predetermined surface areas further including apparatus providing the structure an orientation relative to the predetermined surface areas and where in response to said orientation, the multiplicity of light sources is arranged on the structure according to the respective light distribution patterns so that the surface areas are illuminated with the design luminance.

52 [New] The illuminating device of claim 51 further including apparatus uniquely orienting the structure relative to the predetermined surface areas.

53 [New] The illuminating device of claim 51 wherein the respective spectral distributions combine to form the overall light distribution pattern calculated to efficiently provide the predetermined surfaces with the design illuminance and color.

54 [New] The illuminating device of claim 50 wherein the predetermined surfaces are equidistant from the light source and the design illuminance on the respective predetermined surfaces are not equal.

55 [New] The illuminating device of claim 50 wherein the predetermined surfaces are non-equidistant and the design illuminance on the respective predetermined surfaces are equal.

56 [New] The illuminating device of claim 50 wherein any of the design illuminance and color is any of different and similar combinations for respective predetermined surface areas.

57 [New] The illuminating device of claim 51 wherein the design illuminance level is uniform illumination over to at least one of the surface areas and a certain height relative to the surface areas irrespective if the surface area is directly below the illuminating device or off in a distant corner of a room.

58 [New] The illuminating device of claim 51 wherein the design illuminance level is increased task lighting illuminance on certain surface areas and general lighting illuminance level over the rest of the surface areas.

59 [New] The illuminating device of claim 51 wherein the light source is at least one of substantially monochromatic LEDs and white LEDs.

60 [New] The illuminating device of claim 51 wherein the illuminating device is a luminaire based on specific lighting application criteria according to principles of correct lighting practice to provide the design illuminance and color such that the luminaire provides a controlled illumination intensity, spectrum, luminous exitance and spatial distribution of intensity and spectrum, suited to the specific lighting application, and optionally where the luminaire design criterion includes any items from the list comprised of: a requirement of maintaining an acceptable continuum of spatial

illumination and a requirement of maintaining an acceptable continuum of spatial color effects and the requirement for maintaining an acceptable glare rating for the luminaire.

61[New] The illuminating device of claim 60 wherein the intensity, spectrum, and spatial distribution of intensity and spectrum is adjusted for changes in a living space to be illuminated in accordance with the lighting application comprising:

(a) a means for sensing the changes; and

(b) a means for changing the light emanating characteristics of the light sources, thereby providing the correct intensity, spectrum, and spatial distribution of intensity and spectrum as a function of time.

62 [New] The luminaire of claim 60, further including any items from the list comprised of::

(a) a power connection apparatus in communication with the mains power;

(b) a power supply element providing current at a voltage to the light sources and other ancillary equipment;

(c) a differentiated power supply element capable of varying power to the respective light sources said power supply arranged to effect an independent electric power signal differentiated in voltage, current or frequency to the respective light sources or group of light sources;

(d) a controller for adjusting the power signal to the light sources such that a particular amount of power supplied to the light source generates a corresponding intensity and provides the correct intensity, spectrum, and spatial distribution of intensity and spectrum for the lighting application;

(e) a storage media device capable of storing and recalling stored data relating to performance, algorithms and lighting parameters;

(f) a controller capable of receiving inputs and by means of recalling stored parameters, processing algorithms, and calculating results, generates output control signals to adjust the illuminance according to the correct lighting practice;

(g) a photosensor for providing light spectrum and intensity information to the controller, said information for use in said adjusting;

(h) a motion detector for providing occupant sensing information to the controller, said information for use in said adjusting;

(i) a communications element coupled to the controller comprised of a receiver for receiving a data signal from an external device;

(j) a communications element coupled to the controller comprised of a transmitter for transmitting a data signal to an external device;

(k) a remote control man-machine interface input device capable of communicating data with the communications element;

(l) a machine vision system comprised of an imaging device, and object recognition coupled to the controller and

(m) a mechanical assembly for the support of light sources, power supplies, controllers, sensors and other ancillary equipment;

63 [New] The illuminating device of claim 60, wherein said controller is selected from the list consisting of:

(a) an open-loop controller, factory programmed, for use in general lighting according to correct lighting practice;

(b) an open-loop controller, user-programmed, by use of a programming method taking into account the lighting requirements of the environment in which the luminaire is to be used;

(c) a closed loop controller, user-programmed, by use of a programming method taking into account the lighting requirements of the environment in which the luminaire is to be used;

(d) a closed loop controller user-programmed, by use of a programming method taking into account the lighting requirements of the environment and self-adjusting in response to the changing lighting requirements of the environment in which the luminaire is located;

(e) a closed loop controller, self-adjusting in response to the lighting requirements of the environment in which the luminaire is located, without pre-programming.

64 [New] A method for constructing an illuminating device having an overall light distribution pattern calculated to efficiently provide predetermined surface areas with a design illuminance and color, comprising the steps of:

(a) selecting a multiplicity of light sources having respective spectral distributions and respective directional light distribution patterns which subtend lesser angles than the angle subtended by the overall light distribution pattern, and

(b) mounting said light sources on a structure such that the respective directional light distribution patterns and the respective spectral distributions combine to form said overall light distribution pattern calculated to efficiently provide the predetermined surface areas with the design illuminance,

whereby the overall light distribution pattern, subtending greater angles than that of the respective light distribution patterns is produced directly by the multiplicity of light sources without recourse to at least one of non-integral reflectors and refractors.

65 [New] The method for constructing an illuminating device of claim 64 intended for positioning relative to the predetermined surface areas further comprising the steps of:

(a) providing the structure an orientation relative to the predetermined surface areas, and

(b) arranging the multiplicity of light sources on the structure in response to said orientation, according to the respective light distribution patterns so that the surface areas are illuminated with the design luminance.

66 [New] The method for constructing an illuminating device of claim 65 wherein the structure is provided a unique orientation relative to the predetermined surface areas.

67 [New] The method for constructing an illuminating device of claim 66 wherein the mounting of the multiplicity of light sources on the structure is through the calculation of Lambert's Law based on the respective light source light distribution patterns and the respective predetermined surface areas design illuminance.

68 [New] The method of claim 64 for a specific lighting application in a predetermined living space further comprising the steps of:

(a) determining the illuminance and spectrum requirements of the lighting application and visual tasks to be carried out within the living space, and

(b) determining an illumination area, distances from the illuminating device of the surfaces within the living space to be illuminated, and

(c) selecting the light source intensity, spatial intensity distribution, spectral wavelength characteristic and directionality aimings of the respective multiplicity of light sources mounted on said structure required to efficiently provide the predetermined surface areas with the design illuminance.

69 [New] The method for designing the illuminating device of claim 68 including power control elements according to correct lighting practice, providing light intensity, spectrum, glare related luminous exitance and spatial distribution of intensity and spectrum, suited to a living space to be illuminated further comprising steps selected from the group consisting of:

(a) determining light power required to effect the required illumination over the area;

(b) selecting light sources capable of producing required intensities and spectrum at highest conversion efficiencies at lowest economic cost;

(c) determining light source beam spreads;

(d) determining light source aimings for the required distribution pattern;

(e) determining electronics to control and power light source;

(f) determining lighting fixture surface geometry size and glare rating;

(g) testing whether the glare rating for the viewing angle is acceptable;

(h) if the glare rating is not acceptable, changing light source beam spread and fixture geometries, or size, resulting in an acceptable glare rating;

(i) when the glare rating is acceptable, then designing the luminaire aesthetics for the application

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Date: January 17, 2007

Certificate of Facsimile Transmission:

I certify that on the date below I will fax this communication to Group 2875 of the Patent Office at the following number:

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Date : January 17, 2007

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